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Crystal chemical and geochemical features of genetically different paleozoic dolomites in the Volga–Ural region

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Abstract

© 2017, Pleiades Publishing, Inc.The comparative analysis of primary sedimentary and secondary catagenetic dolomites revealed that they differ in many typomorphic properties. Sedimentary dolomites are characterized by the pelitomorphic and fine-grained structure, high stoichiometry, and presence of the electron-hole (p-n) centers [SO2]– and [SO3]– in the structure. Secondary dolomites have a fine- to medium-grained structure and distinguished by a lower degree of stoichiometry. Their crystal lattice shows isomorphous replacements Mg ↔ Fe and Mg ↔ Ca. They can be divided into two (massive and porous) varieties. The massive varieties are characterized by the conformal structure and xenomorphic habitus of the closely packed idiomorphic and hypidiomorphic grains. The Ca–Mg and Fe–Mg isomorphism in the massive dolomites is less expressed than in the porous varieties. These specific features of dolomite varieties are related to their different formation settings. The porous dolomites were formed in a free environment that fostered slow growth of the relatively large equant crystals with a high degree of isomorphism, whereas the massive dolomites were formed under “stringent constraints” during a faster growth of crystals.

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